ANSWERS FOR EXAMPLE 1. HYPOTHETICAL CEMENT PLANT SCENARIO

FACILITY: CEMENT PLANT

- Major (Listed) Source – Existing facility allowable emissions > 100 tpy for criteria pollutants NO_x, SO_2, and CO
- Existing facility PTE > 100K CO_2-e
- Existing facility PTE < 100K tpy GHG

PROPOSED PROJECT: *A cement plant proposes to introduce a new fuel to mid-kiln firing. The project will increase CO emissions by 98 tons per year*

In addition, there will be an increase in the following GHG emissions:

CH_4 = 100 tpy N_2O = 27 tpy CO_2 = 68,000 tpy

Question 1: On a mass basis, what are the total emissions of GHGs?

CO_2+CH_4+N_2O = Total Emissions of GHG's (MASS)

68,000 tons + 100 tons + 27 tons = **68,127 tons/year**

Question 2: What are the total emissions of CO_{2e}?

Step 1: Refer to Global Warming Potential (GWP) Table (Title 40, Part 98, Subpart A, Table A-1)
Step 2: Identify pollutants and their respective GWPs.

Pollutant	Global Warming Potential
CO_2	1
CH_4	21
N_2O	310

$$CO_{2e}(tpy) = \sum_i (GWP_i \times MassEmissionRate_i(tpy))$$

CO_{2e}(tpy) = (68,000*1) + (100*21) + (27*310) = **78,127 tons/yr**

APPLICABILITY ANALYSIS (PSD):

Criteria Pollutant emissions increase = 98 ton/yr of CO (<SER of 100 ton/yr for CO)
GHG Mass emissions total = 68,127 ton/yr (>0 GHG mass)
CO_2-e emissions total = 78,470 (>75,000 CO_{2e})

Question 1: Does the permit action result in a net increase of any criteria pollutant that exceeds a PSD SER level? **No**
Question 2: Does the permit action have CO2e emissions in excess of PSD threshold? **Yes**
Question 3: Does the permit action have GHG emissions in excess of PSD threshold (mass basis)? **Yes**

Step 1 -- January 2, 2011 – No PSD requirements – even though GHG is >0 and CO_2-e > 75,000, it is not a PSD anyway source because the increase in CO emissions are less than the significant emissions rate.
Step 2 – July 1, 2011 – PSD analysis for GHG required – Now, because GHG is >0 and CO_2-e > 75,000, even though it's not a PSD "anyway source" GHG's would have to go through PSD analysis.

ADJUSTED PROPOSED PROJECT: *A cement plant proposes to introduce a new fuel to mid-kiln firing. The project will increase CO emissions by 110 tons per year*

ADJUSTED SCENARIO APPLICABILITY ANALYSIS (PSD):

Criteria Pollutant emissions increase – CO = 110 tpy (> SER – 100 for CO)
GHG Mass emissions total = 68,127 tpy (> 0 GHG)
CO_2-e emissions total – 78,470 (> 75,000 CO_2-e)

Question 1: Does the permit action result in a net increase of any criteria pollutant that exceeds a PSD SER level? **Yes**
Question 2: Does the permit action have CO2e emissions in excess of PSD threshold? **Yes**
Question 3: Does the permit action have GHG emissions in excess of PSD threshold (mass basis)? **Yes**

Step 1 -- January 2, 2011 – PSD analysis required for CO and GHG
Step 2 – July 1, 2011 – PSD analysis required for CO and GHG

ANSWERS TO EXAMPLE 2. HYPOTHETICAL CEMENT PLANT SCENARIO

FACILITY: CEMENT PLANT

- Major (Listed) Source – Existing facility allowable emissions > 100 tpy for criteria pollutants NO_x, SO_2, and CO
- Existing facility PTE > 100K CO_2e
- Existing facility PTE < 100K tpy GHG

PROPOSED PROJECT: *A cement plant proposes to modify their existing facility to increase production. The project will increase fuel usage, increasing the CO, SO_2, and NO_x as well as GHG's..*

Criteria Pollutant	Emissions Increase	GHG	Emissions Increase
NO_x	375 tons/yr	CH_4	160 tons/yr
SO_2	55 tons/yr	N_2O	50 tons/yr
CO	20 tons/yr	CO_2	125,000 tons/yr

Question 1: On a mass basis, what are the total emissions of GHGs?

CO_2+CH_4+N_2O = Total Emissions of GHG's (MASS)

125,000 tons + 160 tons + 50 tons = **125,000 tons/year**

Question 2: What are the total emissions of CO_{2e}?

Step 1: Refer to Global Warming Potential (GWP) Table (Title 40, Part 98, Subpart A, Table A-1)
Step 2: Identify pollutants and their respective GWPs.

Pollutant	Global Warming Potential
CO_2	1
CH_4	21
N_2O	310

$CO_{2e}(tpy) = \sum_i (GWP_i \times MassEmissionRate_i(tpy))$

CO_{2e}(tpy) = (125,000*1) + (160*21) + (50*310) = **143,860 tons/yr**

APPLICABILITY ANALYSIS (PSD):

Criteria Pollutant emissions increase = NO_x = 375 tons/yr (>SER of 40 tons/yr for NO_x); SO_2 = 55 tons/yr (>SER of 40 tons/yr for SO_2)
GHG Mass emissions total = 125,210 tons/yr (>GHG)
CO_{2e} emissions total = 143,860 (>75,000 tons/yr CO_{2e})

Question 1: Does the permit action result in a net increase of any criteria pollutant that exceeds a PSD SER level? **Yes**
Question 2: Does the permit action have CO2e emissions in excess of PSD threshold? **Yes**
Question 3: Does the permit action have GHG emissions in excess of PSD threshold (mass basis)? **Yes**
Step 1 -- January 2, 2011 – PSD for NO_x and SO_2 and GHG
Step 2 – July 1, 2011 –- PSD for NO_x and SO_2 and GHG